WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
WESTERN UNITED STATES
Including Columbia River Drainage in Canada

UNITED STATES DEPARTMENT of AGRICULTURE···SOIL CONSERVATION SERVICE
Collaborating with
CALIFORNIA DEPARTMENT of WATER RESOURCES
and
BRITISH COLUMBIA DEPARTMENT of
LANDS, FORESTS and WATER RESOURCES

AS OF
FEB. 1, 1966

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

To Recipients of Water Supply Outlook Reports:

Most of the usable water in western states originates as mountain snowfall This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season as they affect runoff will add to be an effective average. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1400 snow courses in Western United States and in the Columbia Basin in British Columbia. In the near future, it is anticipated that automatic snow water equivalent sensing devices along with radio telemetry will provide a continuous record of snow water equivalent at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

Listed below are water supply outlook reports based on Federal-State-Private Cooperative snow surveys. Those published by the Soil Conservation Service may be obtained from Soil Conservation Service, Room 507, Federal Building, 701 N. W. Glisan, Portland, Oregon 97209.

PUBLISHED BY SOIL CONSERVATION SERVICE

REPORTS	ISSUED	LOCATION	COOPERATING WITH
RIVER BASINS			
WESTERN UNITED STATES	MONTHLY (FEB.-MAY)	PORTLAND, OREGON	ALL COOPERATORS
BASIC DATA SUMMARY	OCTOBER 1	PORTLAND, OREGON	ALL COOPERATORS
STATES			
ALASKA	MONTHLY (MAR.-MAY)	PALMER, ALASKA	ALASKA S.C.D.
ARIZONA	SEMI-MONTHLY (JAN.15 - APR.1)	PHOENIX, ARIZONA	SALT R. VALLEY WATER USERS ASSOC. ARIZ. AGR. EXP. STATION
COLORADO AND NEW MEXICO	MONTHLY (FEB.-MAY)	FORT COLLINS, COLORADO	COLO. STATE UNIVERSITY COLO. STATE ENGINEER N. MEX. STATE ENGINEER
IDAHO	MONTHLY (JAN.-JUNE)	BOISE, IDAHO	IDAHO STATE RECLAMATION ENGINEER
MONTANA	MONTHLY (JAN.-JUNE)	BOZEMAN, MONTANA	MONT. AGR. EXP. STATION
NEVADA	MONTHLY (JAN.-MAY)	RENO, NEVADA	NEVADA DEPT. OF CONSERVATION AND NATURAL RESOURCES - DIVISION OF WATER RESOURCES
OREGON	MONTHLY (JAN.-JUNE)	PORTLAND, OREGON	OREG. STATE UNIVERSITY OREGON STATE ENGINEER
UTAH	MONTHLY (JAN.-JUNE)	SALT LAKE CITY, UTAH	UTAH STATE ENGINEER
WASHINGTON	MONTHLY (FEB.-JUNE)	SPOKANE, WASHINGTON	WN. STATE DEPT. OF CONSERVATION
WYOMING	MONTHLY (FEB.-JUNE)	CASPER, WYOMING	WYOMING STATE ENGINEER

PUBLISHED BY OTHER AGENCIES

REPORTS	ISSUED	AGENCY
BRITISH COLUMBIA	MONTHLY (FEB.-JUNE)	WATER RESOURCES SERVICE, DEPT. OF LANDS, FOREST AND WATER RESOURCES, PARLIAMENT BLDG., VICTORIA, B.C., CANADA
CALIFORNIA	MONTHLY (FEB.-MAY)	CALIF. DEPT. OF WATER RESOURCES, P.O. BOX 388, SACRAMENTO, CALIF.

USDA-SCS-PORTLAND OREG 1965

WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
WESTERN UNITED STATES
Including Columbia River Drainage in Canada

ISSUED

FEBRUARY 1, 1966

The Soil Conservation Service coordinates snow surveys conducted by its staff and many cooperators, including the Bureau of Reclamation, Corps of Engineers, Forest Service, National Park Service, Geological Survey, and other Federal Agencies, Departments of State Government, Irrigation Districts, Power Companies, and others.

The Department of Water Resources coordinates snow surveys in California.

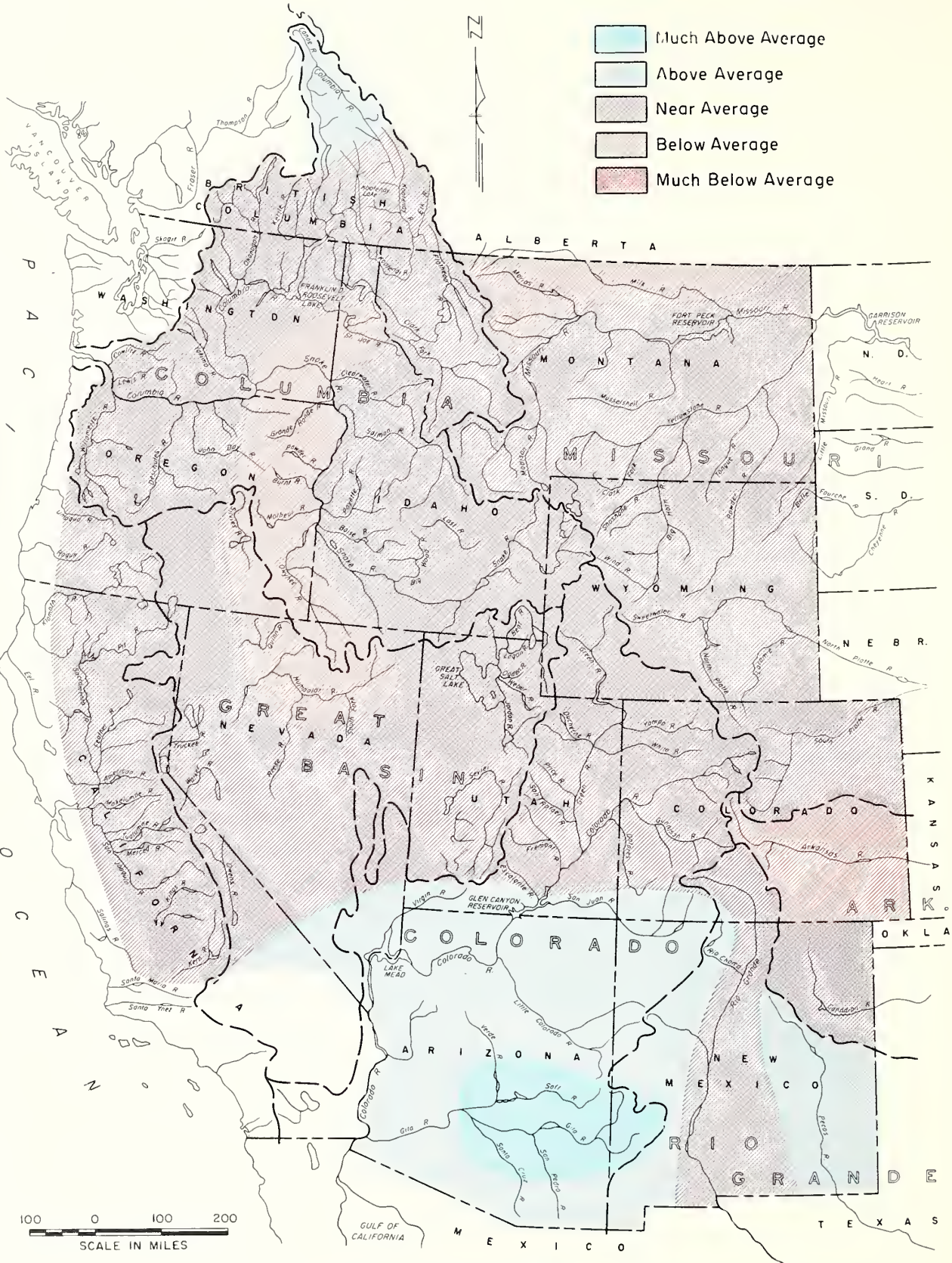
The Water Resources Service, Department of Lands, Forests, and Water Resources directs snow surveys in British Columbia.

This report was prepared by the Water Supply Forecasting Branch, Engineering Division, Soil Conservation Service, from data supplied by Snow Survey Supervisors of the Soil Conservation Service in the States of Arizona, Colorado and New Mexico, Idaho, Montana, Nevada, Oregon, Utah, Washington and Wyoming.

Data from California was supplied by the Chief, Water Supply Forecast and Snow Surveys Unit, Department of Water Resources.

Data from British Columbia was supplied by the Chief, Hydrology Division, Water Investigations Branch, Department of Lands, Forests and Water Resources.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
D. A. WILLIAMS, ADMINISTRATOR



PROSPECTIVE STREAMFLOW

WATER SUPPLY OUTLOOK

As of February 1, 1966

MID-WINTER SNOW ACCUMULATION RANGES NEAR AVERAGE IN WESTERN MOUNTAIN AREAS. WITH SUBSTANTIAL CARRYOVER STORAGE WATER SUPPLY PROSPECTS ARE GENERALLY GOOD TO EXCELLENT.

Streamflow forecasts for most western streams are near average for the 1966 snowmelt season. The high runoff year of 1965 left reservoirs with more than usual water in storage, especially those reservoirs which serve irrigation and municipal needs. If snowfall for the remainder of the season is near average, the combination of high carryover storage and average streamflow is expected to provide reasonably adequate water supplies.

SNOWPACK

Snowfall to February 1 ranged from 80 to 100 percent of average for the date with few exceptions. A deficiency in snowfall exists in eastern Oregon and southeastern Washington extending into northern Nevada. Excessive snowfall as well as heavy precipitation and resulting streamflow has occurred in central Arizona watersheds including all Gila River tributaries. Above average snowfall has extended from this area north along the Continental Divide to the San Juan headwaters in Colorado. Isolated areas of above average snowfall include the Cascade range in Oregon and to a lesser degree the upper Columbia Basin in Canada.

The California Department of Water Resources reports that snowpack, reservoir storage and runoff conditions are above that expected for this date. Major storms in southern California during November and December made significant contributions to the local areas' water supply; although this area is dependent on imported water, this improvement in local supply is a pleasant change. With forecasts of normal runoff from its sources of import, southern California water supplies for the water year should be adequate.

The snowpack in headwater areas of streams of the Central Valley is about 120 percent of the February 1 average with the greatest amounts observed on the watersheds at the northern and southern extremes.

STORAGE

Storage in power reservoirs on the Columbia is at near average levels. On the Missouri River main stem, total reservoir storage is relatively high as compared to most years. While Lake Mead has below average storage, the total storage in all reservoirs on the Colorado system improved substantially from the high runoff of 1965. Extremely favorable reservoir storage is present on the Gila, Salt and Verde in Arizona, the Snake River and tributaries in Idaho and in municipal reservoirs for the major cities.

STREAMFLOW FORECASTS

For the major tributaries streamflow forecasts are for near average flows for the Columbia at The Dalles, Oregon; for the Colorado, inflow to Lake Powell, points along the upper Missouri, and for California Central Valley streams as they emerge from the Sierras. Except for the Columbia Basin above its confluence with the Snake River, the flows forecasted as of this date are substantially less than those which occurred in 1965. Some Upper Columbia streams may exceed that for the 1965 snowmelt season which was slightly less than average.

Winter streamflow has been well above average in all areas outside of the Columbia Basin.

MISSOURI BASIN

Snow cover on the Missouri River watershed from the headwaters of the main stem above Three Forks, Montana to the South Platte in Colorado is near about three-quarters of average and one-half or less of that on February 1, a year ago. On Missouri River tributaries in northern Montana, the Marias, Sun and Milk rivers, seasonal snowfall has been more deficient, only 50 percent of average to date. However, water supply outlook on Upper Missouri and Yellowstone tributaries is good. Some shortage could occur on small streams in late season, should snowfall continue to be deficient for the remainder of the season.

Reservoir storage is favorable for all purposes, particularly in large main stem reservoirs.

SUMMARY OF SNOW WATER EQUIVALENT MEASUREMENTS FEBRUARY 1, 1966

MAJOR BASIN AND SUB — WATERSHED	WATER EQUIVALENT IN PERCENT OF: LAST YEAR	AVERAGE
MISSOURI BASIN		
Jefferson	49	78
Madison	42	76
Gallatin	40	65
Missouri Main Stem	40	53
Yellowstone	52	81
Shoshone	50	77
Wind	47	69
North Platte	58	77
South Platte	50	60
ARKANSAS BASIN		
Arkansas	66	91
Canadian	43	60
RIO GRANDE BASIN		
Rio Grande (Colo.)	75	112
Rio Grande abv. Otowi Bridge	76	107
Pecos	82	150
COLORADO BASIN		
Green (Wyo.)	38	72
Yampa - White	66	84
Duchesne	85	106
Price	73	95
Upper Colorado	74	86
Gunnison	80	95
San Juan	78	110
Dolores	76	110
Virgin	155	148
Gila	150	175
Salt	147	161
GREAT BASIN		
Bear	56	92
Logan	55	89
Ogden	66	91
Weber	55	94
Provo - Utah Lake	61	87
Jordan	48	83
Sevier	115	106
Walker - Carson	64	126
Tahoe - Truckee	65	117
Humboldt	72	69
Lake Co. (Oregon)	68	101
Harney Basin (Oregon)	45	68
UPPER COLUMBIA BASIN		
Columbia (Canada)	118	107
Kootenai	109	116
Clark Fork	58	78
Bitterroot	37	56
Flathead	73	91
Spokane	73	82
Okanogan	95	104
Methow	85	90
Chelan	84	82
Wenatchee	70	93

MAJOR BASIN AND SUB — WATERSHED	WATER EQUIVALENT IN PERCENT OF: LAST YEAR	AVERAGE
SNAKE BASIN		
Snake above Jackson, Wyo.	45	71
Snake above Hiese, Idaho	44	75
Snake abv. American Falls Res.	43	77
Henry's Fork	42	80
Southern Idaho Tributaries	35	64
Big and Little Wood	40	90
Boise	42	80
Owyhee	49	66
Payette	51	87
Malheur	37	60
Weiser	47	74
Burnt	41	70
Powder	41	74
Salmon	42	78
Grande Ronde	46	79
Clearwater	71	83
LOWER COLUMBIA BASIN		
Yakima	74	88
Umatilla	49	81
John Day	48	80
Deschutes - Crooked	80	115
Hood	107	123
Willamette	101	133
Lewis	100	143
Cowlitz	81	97
PACIFIC COASTAL BASIN		
Puget Sound	80	86
Olympic Peninsula	106	108
Umpqua - Rogue	94	132
Klamath	76	109
Trinity	120	145
CALIFORNIA CENTRAL VALLEY		
Upper Sacramento	115	150
Feather	80	125
Yuba	75	115
American	70	115
Mokelumne	65	105
Stanislaus	65	110
Tuolumne	65	110
Merced	70	115
San Joaquin	70	115
Kings	80	125
Kaweah	75	115
Tule	75	110
Kern	80	110

Data for California Watersheds supplied by Dept. of Water Resources, and for British Columbia Watersheds by Dept. of Lands, Forests and Water Resources.

Average is for 1948-62 period. California averages are for the period 1931-1960.
Based on Selected Snow Courses determined by Distribution within the Basin, Length of Record and Repetitive Monthly Measurement Schedules.

For the Bighorn drainage in Wyoming, water supply will be adequate assuming near average snowfall for the remainder of the season. Storage in general is above average because of high flows and relatively light demands in 1965. As of this date less than average snowmelt season streamflow is forecast.

For the North Platte, carryover storage is near average and substantially above that of a year ago. Streamflow forecasts are for slightly less than average snowmelt season flow at this time. The total of storage and streamflow will be well in excess of requirements for irrigation along the North Platte and its main tributaries in Wyoming and western Nebraska.

Outlook for the South Platte in Colorado is also excellent. Forecasts of flow are slightly below average. Storage in the Colorado-Big Thompson reservoir is above that of a year ago at near 50 percent of capacity. There is an excellent carryover in smaller irrigation reservoirs. With additional reservoir capacity, storage for the City of Denver is at a record high. Even a limited shortage of water is unlikely even if snowfall is deficient for the remainder of the season.

ARKANSAS BASIN

Streamflow forecasts for the Arkansas and its tributaries in Colorado are for below average flow as of mid-winter. Water supply outlook is fair to good in this area with relatively high carryover storage in both mountain and plains reservoirs including John Martin. High rainfall floods in June of 1965 along with above average snowmelt runoff provided for a substantial improvement in the storage situation from a year ago.

For the Canadian drainage in New Mexico snowfall in the Sangre de Cristo Range has been relatively light to date. Here, also, carryover storage provides a favorable outlook for 1966.

Both mountain and valley soils tend to be well wetted.

RIO GRANDE BASIN

For the main Rio Grande, snow accumulation to date, has been near average and streamflow forecasts reflect this trend, as compared to the 1948-62 period. This was a relatively dry period as compared to longer term records. Storage in the upper basin in Colorado exceeds average and is among the higher years of record. El Vado reservoir serving the middle Rio Grande area in New Mexico is empty for repairs. Storage in Elephant Butte serving the lower Rio Grande area of New Mexico and west Texas is relatively high but only one-quarter of capacity. Total storage equals or exceeds any carryover of the past ten to fifteen years. As usual, total surface water supply is less than probable demands. Total surface water in prospect is slightly less than that which was available a year ago, but much better than most recent years.

COLORADO BASIN

Snowfall to February 1 has been near or slightly less than average over the Colorado River Basin. The least snowfall has occurred on the Green River in Wyoming and the tributaries to the Green River in northwestern Colorado. The greater snowpack exists on the San Juan headwaters in southwestern Colorado and tributaries in southern Utah on the fringes of the heavy storm area centered on the Gila and Salt headwaters in Arizona.

Mountain watersheds are wet, and streamflow has been high during the winter months. These factors tend to produce streamflow forecasts slightly in excess of that indicated by the present snowpack.

Storage in Lakes Mead, Powell, Navajo and Flaming Gorge improved substantially as a result of the above average runoff season of 1965 and now totals 27,000,000 acre feet.

Water supply outlook is good for tributary streams in Utah with near average streamflow in prospect and good carryover storage from a year ago.

For the Central Valley of Arizona, surface water supply is expected to exceed that for any year in the past 25 years. Reservoir storage is at the highest level since the early 1940's. Forecasts of streamflow are far in excess of the 1948-62 period average, but this is recognized as a generally low runoff period. Except for San Carlos, all reservoirs are expected to spill during the snowmelt runoff.

Inflow to Lake Powell is expected to be near average for the April-July 1966 period.

GREAT BASIN

Water supply outlook is good over the interior basin including the irrigated areas of Nevada and western Utah, and the Bear River Basin in Wyoming and Idaho. Snow

SELECTED STREAMFLOW FORECASTS APRIL-SEPTEMBER 1966 as of FEBRUARY 1, 1966

STREAM AND STATION	1000 ACRE-FEET		PERCENT OF AVERAGE
	FLOW	FORECAST	
UPPER MISSOURI	1965	1966	
Jefferson at Sappington, Montana			
Madison near Grayling, Montana 1/			
Gallatin near Gateway, Montana			
Missouri near Zortman, Montana 2/			
Sun at Gibson Dam, Montana 3/			
Marias near Shelby, Montana 4/			
Milk near Eastern Crossing, Montana			
Yellowstone at Livingston, Montana			
Shields at Clyde Park, Montana			
Clark Fork at Chance, Montana			
Shoshone, Inflow to Buffalo Bill Res., Wyo.		660	82
Wind at Dubois, Wyoming		78	78
Bull Lake near Lenore, Wyoming		157	89
Tensleep near Tensleep, Wyoming		38	53
Yellowstone at Miles City, Montana 5/			
Missouri near Williston, N. Dakota 6/			
PLATTE			
North Platte at Saratoga, Wyoming		590	92
Laramie near Jelm, Wyoming 7/		110	98
Clear at Golden, Colorado		115	86
St. Vrain at Lyons, Colorado		70	87
Cache LaPoudre near Fort Collins, Colorado 8/		210	85
ARKANSAS			
Arkansas at Salida, Colorado 9/		265	77
Purgatoire at Trinidad, Colorado			
RIO GRANDE			
Rio Grande near Del Norte, Colorado 10/		450	91
Conejos near Mogote, Colorado 11/		200	102
Rio Chama near LaPuente, New Mexico		275	128
Rio Grande at Otowi Bridge, New Mexico 12/		600	99
Pecos at Pecos, New Mexico *		75	140
UPPER COLORADO			
Colorado near Granby, Colorado 13/		220	94
Colorado near Glenwood Springs, Colorado 14/		1425	91
Roaring Fork at Glenwood Springs, Colorado 15/		725	95
Gunnison at Grand Junction, Colorado		1270	97
Dolores at Dolores, Colorado		300	115
Colorado near Cisco, Utah	5442	3950	104
Green below Flaming Gorge Res., Utah 16/ **	1251	1100	96
Yampa at Steamboat Springs, Colorado		250	86
White at Meeker, Colorado		255	77
Duchesne near Tabiona, Utah 17/		112	98
Rock Creek near Mountain Home, Utah		109	107
Price near Scofield, Utah 18/		34	92
Green at Green River, Utah 16/		2950	88
San Juan near Rosa, New Mexico		730	122
Animas at Durango, Colorado		550	121
San Juan near Bluff, Utah 19/	2090	1410	120
Colorado, Inflow to Lake Powell, Arizona 20/ **	11810	7700	101
LOWER COLORADO			
Gila near Solomon, Arizona (March-May)		315	405
Salt at Intake, Arizona (March-May)		616	272
Verde above Horseshoe Dam, Arizona (March-May)		340	300

SELECTED STREAMFLOW FORECASTS APRIL-SEPTEMBER 1966 as of FEBRUARY 1, 1966

STREAM AND STATION	1000 ACRE-FEET		PERCENT OF AVERAGE
	FLOW	FORECAST	
	1965	1966	
GREAT BASIN			
Bear at Harer, Idaho		295	114
Logan near Logan, Utah 21/	183	122	92
Ogden, Inflow to Pine View Res., Utah 22/(Mar.-July	161	126	98
Weber near Oakley, Utah	188	124	101
Inflow to Utah Lake, Utah	381	280	99
Big Cottonwood near Salt Lake City, Utah	48	38	97
Beaver near Beaver, Utah	28	24	99
South Fork Humboldt near Elko, Nevada			
Humboldt at Palisades, Nevada		145	84
Truckee at Farad, California 25/			
East Carson near Gardnerville, Nevada			
West Walker near Coleville, California		160	114
Owens, below Long Valley Dam, California			
UPPER COLUMBIA			
Columbia at Revelstoke, British Columbia			
Kootenai at Wardner, British Columbia			
Kootenai at Leonia, Idaho	9133	9970	107
Flathead near Columbia Falls, Montana 26/	6798		
Flathead near Polson, Montana 26/			
Clark Fork above Missoula, Montana	2286		
Bitterroot near Darby, Montana	724		
Clark Fork at Whitehorse Rapids, Montana 26/		11800	82
Columbia at Birchbank, British Columbia 26/	43110	50460	117
Spokane at Post Falls, Idaho 27/		2800	82
Columbia at Grand Coulee, Washington 26/	69630	72870	104
Okanogan near Tonasket, Washington			
Chelan at Chelan, Washington 28/			
Wenatchee at Peshastin, Washington			
SNAKE			
Snake above Palisades Res., Wyoming 29/		2580	100
Snake near Heise, Idaho 29/		3500	90
Henry's Fork near Rexburg, Idaho 30/			
Big Lost near Mackay, Idaho 31/		165	112
Big Wood, Inflow to Magic Res., Idaho 32/		300	95
Bruneau near Hot Springs, Idaho			
Owyhee Res., Net Inflow, Oregon		225	59
Boise near Boise, Idaho 33/		1500	92
Malheur near Drewsey, Oregon		42	51
Payette near Horseshoe Bend, Idaho 34/		1800	91
Snake at Weiser, Idaho		6600	
Salmon at Whitebird, Idaho		6200	89
Clearwater at Spalding, Idaho		8800	95
LOWER COLUMBIA			
Grande Ronde at LaGrande, Oregon		131	64
Yakima at Cle Elum, Washington 35/			
Deschutes at Benham Falls, Oregon 36/		525	83
Columbia at The Dalles, Oregon 26/	112900	109980	101
Hood near Hood River, Oregon 36/		355	93
Willamette at Salem, Oregon 36/		5330	96
Lewis at Ariel, Washington 37/			
Cowlitz at Castle Rock, Washington			

Forecasts in California provided by Department of Water Resources.
Average is for 1948-62 period except California. California is computed for 1911-60.
Forecasts assume average Effective Climatic Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts Listed on Inside Back Cover.
** April - June Period ** April - July Period*

SELECTED STREAMFLOW FORECASTS APRIL-SEPTEMBER 1966 as of FEBRUARY 1, 1966

STREAM AND STATION	1000 ACRE-FEET		PERCENT OF AVERAGE
	FLOW	FORECAST	
	1965	1966	
NORTH PACIFIC COASTAL			
Dungeness near Sequim, Washington			
Rogue at Raygold, Oregon		1035	103
Klamath Lake, Net Inflow, Oregon		600	94
CALIFORNIA CENTRAL VALLEY 38/**			
Sacramento, Inflow to Shasta, California	2030	1850	103
Feather near Oroville, California	2262	1940	100
Yuba at Smartville, California	1287	1020	91
American, Inflow to Folsom Res., Calif.	1519	1360	98
Cosumnes at Michigan Bar, California	174	150	115
Mokelumne, Inflow to Pardee Res., Calif.	581	450	94
Stanislaus, Inflow to Melones Res., Calif.	880	690	94
Tuolumne, Inflow to Don Pedro Res., Calif.	1493	1160	93
Merced, Inflow to Excheque Res., Calif.	745	600	96
San Joaquin, Inflow to Millerton Lake, Calif.	1421	1190	98
Kings, Inflow to Pine Flat Res., California	1300	1280	109
Kaweah, Inflow to Terminus Res., California	314	250	95
Tule, Inflow to Success Res., California	64	50	89
Kern, Inflow to Isabella Res., California	456	410	95

Forecasts in California provided by Department of Water Resources.
Average is for 1948-62 period except California. California is computed for 1911-60.
Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts listed on Inside Back Cover.
** April - June Period ** April - July Period*

accumulation to date has been near average in Utah, above average for east slope of Sierra streams in Nevada, and below average on the Humboldt in Nevada and the Harney Basin of Oregon. On all watersheds, snow pack is one-half to two-thirds of that which existed on February 1 a year ago.

As with other basins, carryover storage is above average. Wet mountain and valley soils along with above average winter flows add up to the favorable outlook for this mid-winter date.

COLUMBIA BASIN

Snow accumulation, to date, has been above average in the Canadian section of the basin and generally slightly below average on the Clarks Fork and Snake River watersheds in the United States. A greater deficiency in snowpack exists on Snake River tributaries in eastern Oregon. Storms about the first of the year have been responsible for a well above average mid-winter snowpack in the Cascades Range of Oregon.

Mountain and valley soil moisture is near average over the United States section of the basin with above average soil moisture on the Snake River watershed.

Forecasts of the Snake River and major tributaries in Idaho are for near average flows this year. Carryover storage for 1965 is excellent and a good water supply outlook is the general prospect. This outlook prevails along the main river and the Boise, Payette and Weiser tributaries. Flows of the Clearwater and Salmon rivers are expected to be near average. Some deficiency may occur on southern tributaries.

Outlook for water supplies in Oregon for 1966 varies from good in the western third of the state to fair over most of eastern Oregon. Late season water supplies may be poor on the Malheur and Owyhee watersheds except where stored water is available.

In contrast to other western areas, irrigation reservoirs in Washington have less than usual carryover storage. However, they are expected to fill during the snowmelt runoff.

The Water Resources Service, Province of British Columbia, reports that snowpack measurements made at key snow courses in British Columbia watersheds indicate that this year's February 1 snowpack is above average for the Vancouver North Shore, Vancouver Island, Upper Columbia and East Kootenay drainages. This above average snowpack is applicable to all elevations. Except for the heavier than usual low elevation snowpack on the Upper Frazer, most other regions of the Province have close to average February 1 snow accumulation.

The flow of the Columbia at The Dalles is forecast to be average for the 1948-62 period during the snowmelt season.

CALIFORNIA

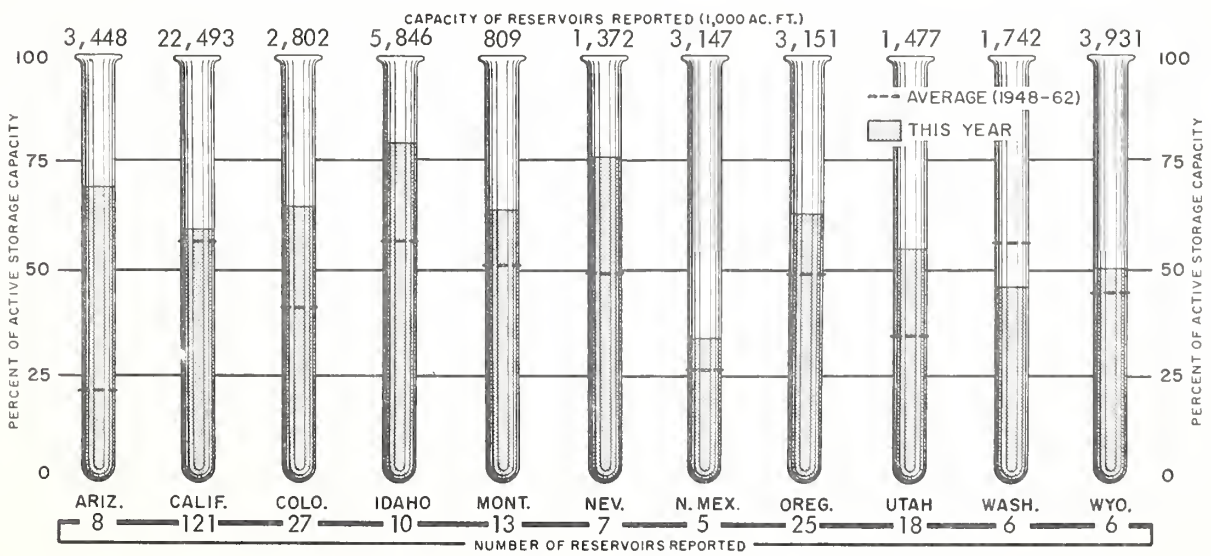
The California Department of Water Resources, coordinating agency for snow surveys and water supply forecasting in California, reports that as of February 1, the principle factors affecting water conditions in California are good and generally above normal for this date. With normal precipitation during the remainder of the season, together with existing snowpack, reservoir storage and general soil moisture conditions, it may be anticipated that near or above average water supply will be available in most areas.

The first significant storms of the 1965-66 season occurred during the second week of November and brought precipitation in varied amounts to all parts of the State. This was followed by a second storm, almost as general, a little more than a week later. In Southern California, the precipitation from these two major storms resulted in record November rainfall. By January 1, state-wide precipitation to date was 140 percent of normal, ranging from 100 percent in the North Coastal area to 310 percent in the South Coastal area.

During the past month, the North Coastal area was the only part of the State that received above normal precipitation. January totals in this area generally ranged between 110 and 170 percent of normal. Most of this rainfall occurred during the first week of the month and, coming on the heels of the late December storm, brought new flood crests to many North Coastal streams. January precipitation in the San Francisco Bay and Sacramento Valley areas was about 80 percent and 60 percent of respective normal amounts, but was less than 50 percent of normal in the remaining areas of the State. Even with this subnormal precipitation for a month, which normally provides about 20 percent of the State's annual rainfall, the season to date total is still 115 percent of normal.

The first extensive snow surveys of the season confirmed the existence of a good early season snowpack throughout the Sierra-Cascade watersheds. Snow depths observed at most courses ranged between 6 and 10 feet; the water content of the snowpack was about 125 percent of February 1 average and 75 percent of the average for April 1 when maximum amounts generally are observed.

RESERVOIR STORAGE as of FEBRUARY 1, 1966



STORAGE IN LARGE RESERVOIRS FEBRUARY 1, 1966

BASIN AND NAME OF RESERVOIR	CAPACITY (1000 A.F.)	STORAGE (1000 A.F.)
UPPER MISSOURI		
Boysen	560	346
Buffalo Bill	380	284
Canyon Ferry	2043	1568
Hebgen	385	222
Tiber	1316	672
Belle Fourche	185	160
Keyhole	190	126
Fort Peck	19105	17000
Fort Randall	6100	2079
Garrison	24500	13174
Oahe	23600	8434
PLATTE		
Glendo	786	320
Pathfinder	1011	410
Seminoe	982	475
City of Denver (6)	578	501
Colo-Big Thompson (4)	865	374
ARKANSAS		
Conchas	280	249
John Martin	367	376
RIO GRANDE		
Elephant Butte	2207	573
El Vado	194	0
UPPER COLORADO		
Flaming Gorge	3789	2414
Navajo	1709	284
Powell	28040	8804
LOWER COLORADO		
Havusu	619	538
Mead	27209	15502
Mohave	1709	1767
San Carlos	1206	375
Salt River Res. (4)	1755	1592
Verde River Res. (2)	322	270
GREAT BASIN		
Bear	1421	1173
Lahontan	286	228
Rye Patch	179	167
Sevier Bridge	236	96
Strawberry	270	115
Tahoe	732	555
Utah	1149	696

BASIN AND NAME OF RESERVOIR	CAPACITY (1000 A.F.)	STORAGE (1000 A.F.)
UPPER COLUMBIA		
Chelan	676	272
Coeur d'Alene	238	54
Flathead	1791	845
Hungry Horse	2982	1935
Kootenay	673	512
Pend Oreille	1155	562
Roosevelt	5232	3170
LOWER COLUMBIA		
Cougar	155	0
Detroit	300	1
Hills Creek	249	1
Lookout Point	337	1
Yakima Res. (5)	1066	511
SNAKE		
American Falls	1700	1281
Arrowrock	287	267
Anderson Ranch	423	376
Brownlee	1427	284
Cascade	653	491
Jackson	847	702
Lucky Peak	278	169
Palisades	1202	1035
Owyhee	715	568
PACIFIC COASTAL		
Cachuma	205	183
Casitas	254	82
Clair Engle	2500	2007
Clear Lake	440	220
Nacimiento	350	186
Ross	1203	968
Upper Klamath	584	273
CALIFORNIA CENTRAL VALLEY		
Almanor	1036	606
Berryessa	1602	1575
Comanche	432	131
Don Pedro	290	118
Folsom	1010	589
Hetch-Hetchy	360	191
Isabella	570	170
McClure	281	138
Millerton	521	398
Pine Flat	1013	609
Shasta	4500	3156

Reservoir Storage Data Provided by Bureau of Reclamation, Corps of Engineers, Geological Survey, and water using organizations. Data from California and British Columbia provided by Department of Water Resources and Department of Lands, Forests and Water Resources, respectively.

Runoff since October 1 was near or above normal in all major hydrographic areas of California, with statewide totals amounting to 110 percent of average. During this period, record and near record flows occurred in South Coastal streams resulting in seasonal runoff of about 700 percent of normal for the area. October-January runoff in the Central Valley was relatively low amounting to only 95 percent of average; well above normal amounts occurred in San Joaquin Valley watersheds and the Upper Sacramento River Basin, but runoff was far below normal (75 percent) in the remaining watersheds of the area.

EXPLANATION of STREAMFLOW FORECASTS

All flows are observed flows except as adjusted for: 1/ Change in storage in Hebgen Lake. 2/ Change in storage in Canyon Ferry and Tiber reservoirs. 3/ Change in storage in Gibson Reservoir and measured diversions. 4/ Change in storage in Two Medicine, Four Horns and Lake Francis reservoirs. 5/ Change in storage in Boysen and Buffalo Bill reservoirs.

6/ Change in storage in Boysen, Buffalo Bill, Canyon Ferry, Tiber, and Fort Peck reservoirs. 7/ Plus diversions to Cache la Poudre. 8/ Minus diversions from North Platte, Laramie, and Colorado rivers plus measured diversions above station. 9/ Change in storage in Twin Lakes and Sugar Loaf reservoirs minus diversions from Colorado River.

10/ Change in storage in Rio Grande, Santa Maria, and Continental reservoirs. 11/ Change in storage in Platoro Reservoir. 12/ Change in storage in El Vado Reservoir. 13/ Change in storage in Granby Reservoir plus diversions to Cache la Poudre and through Adams Tunnel. 14/ Changes as indicated in (13) plus Moffatt Tunnel diversion. 15/ Plus diversions to Arkansas River.

16/ Change in storage in Flaming Gorge and Big Sandy reservoirs. 17/ Plus diversion through Duchesne Tunnel. 18/ Change in storage in Scofield Reservoir. 19/ Change in storage in Navajo Reservoir. 20/ (Lee's Ferry) Change in storage in Flaming Gorge, Navajo, Lake Powell, and Big Sandy reservoirs.

21/ Plus Utah Power and Light Company tailrace and Logan, Hyde Park, and Smithfield canals. 22/ (Inflow record computed by U. S. Bureau of Reclamation.) 23/ Plus diversion by Weber-Provo Canal and change in storage in Wanship Reservoir. 24/ Change in storage in Deer Creek Reservoir, minus diversions through Duchesne Tunnel and Weber-Provo Canal, plus diversion through Salt Lake City Aqueduct. 25/ Change of storage in Lake Tahoe and Boca Reservoir. (Forecast by Truckee Basin Committee)

26/ Change in storage in any of these reservoirs above the station: Kootenai Lake, Hungry Horse, Flathead Lake, Pend Oreille Lake, F. D. Roosevelt Lake, Lake Chelan, Coeur d'Alene Lake, Brownlee and Noxon; and pumpage at Roosevelt Lake. 27/ Changes in storage in Coeur d'Alene Lake and diversions by Spokane Valley Farms Company and Rathdrum Prairie canals. 28/ Change in storage in Lake Chelan. 29/ Changes in storage for Jackson Lake and Palisades Reservoir above stations. 30/ Change in storage in Henry's Lake, Island Park and Grassy Lake reservoirs and diversions between Ashton and Rexburg.

31/ Change in storage in Mackay Reservoir, and diversion in Sharp Ditch. 32/ (Combined flow Big Wood River nr. Bellevue and Camas Creek nr. Blaine.) 33/ Change in storage in Arrowrock, Anderson Ranch, and Lucky Peak. 34/ Change in storage in Cascade and Deadwood reservoirs. 35/ Change in storage in Keechelus, Kachess, and Cle Elum reservoirs plus diversion by Kittitas Canal. 36/ (Corrected to natural flow). 37/ Change in storage in Merwin, Yale, and Swift reservoirs. 38/ (Corrected for upstream impairments).

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
701 N.W. GLISAN, RM. 507
PORTLAND, OREGON 97209

OFFICIAL BUSINESS

POSTAGE AND FEES PAID
U. S. DEPARTMENT OF AGRICULTURE

FIRST CLASS MAIL

FEDERAL - STATE - PRIVATE

COOPERATIVE SNOW SURVEYS

Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation , navigation , mining and industry

"The Conservation of Water begins with the Snow Survey"